Supplementary Information: Tree height, microhabitat, and hydraulic traits shape drought responses in a temperate broadleaf forest

Ian McGregor, Ryan Helcoski, Norbert Kunert, Alan Tepley, Erika Gonzalez-Akre, Valentine Herrmann, Joseph Zailaa, Atticus Stovall, Norman Bourg?, William McShea?, Neil Pederson, Lawren Sack, Kristina Anderson-Teixeira

Supplementary Information

Table 1: Table S1: Species-specific bark thickness regression equations

Species	Equations	r.2
Carya cordiformis	-1.56+0.416*x	0.226
Carya glabra	-0.393+0.268*x	0.040
Carya ovalis	-2.18+0.651*x	0.389
Carya tomentosa	-0.477+0.301*x	0.297
Fagus grandifolia	1*x	NA
Fraxinus americana	0.418+0.268*x	0.256
Juglans nigra	0.346+0.279*x	0.246
Liriodendron tulipifera	-1.14+0.463*x	0.545
Quercus alba	-2.09+0.637*x	0.603
Quercus prinus	-1.31+0.528*x	0.577
Quercus rubra	-0.593+0.292*x	0.087

Table 2: Table S2: Species-specific height regression equations

Species	Equations	r.2
Carya cordiformis	0.391+0.805*x	0.899
Carya glabra	0.654+0.728*x	0.890
Carya ovalis	0.939+0.641*x	0.922
Carya tomentosa	0.851+0.682*x	0.890
Fagus grandifolia	0.574+0.713*x	0.887
Liriodendron tulipifera	1.21+0.559*x	0.760
Quercus alba	2.07+0.318*x	0.523
Quercus prinus	0.594+0.713*x	0.799
Quercus rubra	1.42+0.473*x	0.832
all	0.946+0.621*x	0.868

Table 3: Table S3: Candidate variables for best model

prediction	variable	variable_description	top_model
1.2	position_all	crown position with H	1999
2.2	height.ln.m	ln[H]	all
2.2	height.ln.m	ln[H]	1966
2.3	position_all	crown position alone	1966
2.4	TWI.ln	ln[TWI]	all
2.4	TWI.ln	ln[TWI]	1977
2.4	TWI.ln	ln[TWI]	1999
3.1	rp	ring porosity	1999
3.2	PLA_dry_percent	PLA	all
3.2	PLA_dry_percent	PLA	1966
3.4	mean_TLP_Mpa	TLP	all
3.4	mean_TLP_Mpa	TLP	1977

how do we want to present Table S4? Would it be better as an image of an excel file, since it's so large? Did we want to keep all coefficients here?

Table 4: Table S4: Top model variations for each drought scenario, with dAICc values <= 2

Modnames	Delta_AICc	scen
resist.value ~ height.ln.m+TWI.ln+PLA_dry_percent+mean_TLP_Mpa+(1|sp/tree)	0.00	tree
resist.value ~ height.ln.m+TWI.ln+rp+PLA_dry_percent+(1|sp/tree)	0.37	tree
resist.value ~ height.ln.m+TWI.ln+PLA_dry_percent+(1|sp/tree)	0.59	tree
resist.value ~ position_all+height.ln.m+TWI.ln+PLA_dry_percent+mean_TLP_Mpa+(1|sp/tree)	0.73	tree
resist.value ~ position_all+height.ln.m+TWI.ln+PLA_dry_percent+(1|sp/tree)	0.81	tree
resist.value ~ position_all+height.ln.m+TWI.ln+rp+PLA_dry_percent+(1|sp/tree)	1.05	tree
resist.value ~ height.ln.m+rp+PLA_dry_percent+mean_TLP_Mpa+(1|sp)	0.00	x196
resist.value ~ height.ln.m+rp+PLA_dry_percent+(1|sp)	0.84	x196
resist.value ~ height.ln.m+PLA_dry_percent+(1|sp)	1.44	x196
resist.value ~ position_all+height.ln.m+rp+PLA_dry_percent+mean_TLP_Mpa+(1|sp)	1.60	x196
resist.value ~ height.ln.m+TWI.ln+rp+PLA_dry_percent+mean_TLP_Mpa+(1|sp)	1.97	x196
resist.value ~ position_all+TWI.ln+rp+mean_TLP_Mpa+(1|sp)	0.00	x197
resist.value ~ TWI.ln+rp+mean_TLP_Mpa+(1|sp)	0.09	x197
resist.value ~ height.ln.m+TWI.ln+rp+mean_TLP_Mpa+(1|sp)	1.51	x197
resist.value ~ TWI.ln+rp+PLA_dry_percent+(1|sp)	0.00	x199
resist.value ~ position_all+height.ln.m+TWI.ln+rp+PLA_dry_percent+(1|sp)	0.12	x199
resist.value ~ TWI.ln+rp+mean_TLP_Mpa+(1|sp)	0.37	x199
resist.value ~ position_all+height.ln.m+TWI.ln+rp+mean_TLP_Mpa+(1|sp)	0.54	x199
resist.value ~ position_all+height.ln.m+TWI.ln+rp+(1|sp)	0.91	x199
resist.value ~ TWI.ln+rp+(1|sp)	1.14	x199
resist.value ~ position_all+height.ln.m+rp+PLA_dry_percent+(1|sp)	1.48	x199
resist.value ~ position_all+TWI.ln+rp+PLA_dry_percent+(1|sp)	1.59	x199
resist.value ~ position_all+height.ln.m+rp+mean_TLP_Mpa+(1|sp)	1.71	x199
resist.value ~ position_all+TWI.ln+rp+mean_TLP_Mpa+(1|sp)	1.82	x199
resist.value ~ TWI.ln+rp+PLA_dry_percent+mean_TLP_Mpa+(1|sp)	1.88	x199

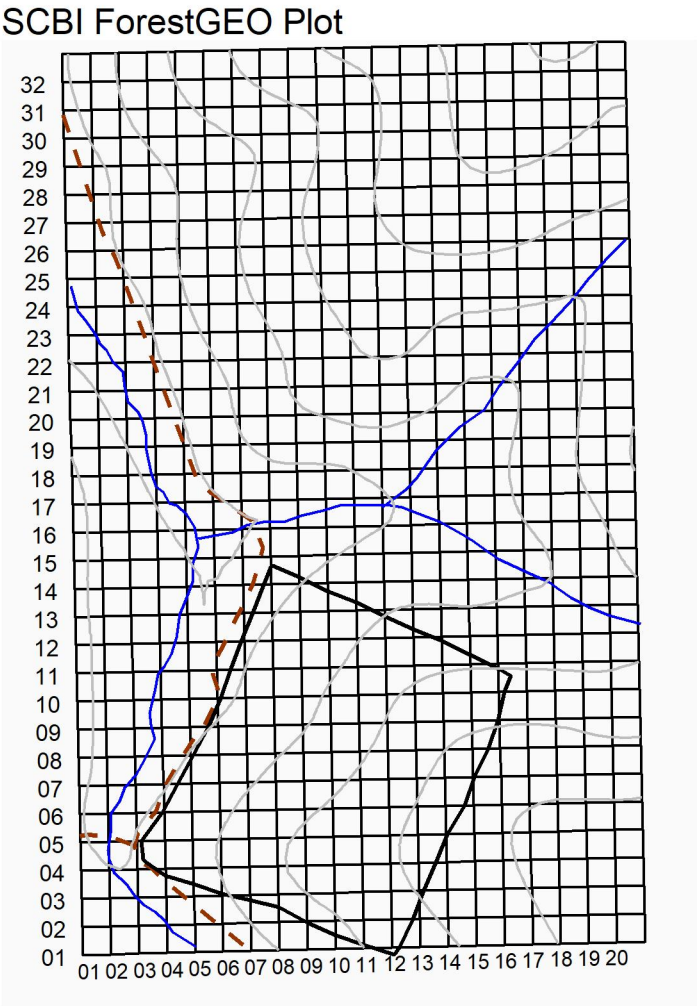

Figure S1: Map of ForestGEO plot

Table 5: Importance of height compared to each trait

variable	model	coefficient	p-value
WD	WD~ln[H]	-0.16	0
LMA	LMA~ln[H]	7.86	0
ring porosity	ring porosity~ln[H]	0.34	0
PLA	PLA~ln[H]	1.37	0
TLP	PLA~ln[H]	0.13	0

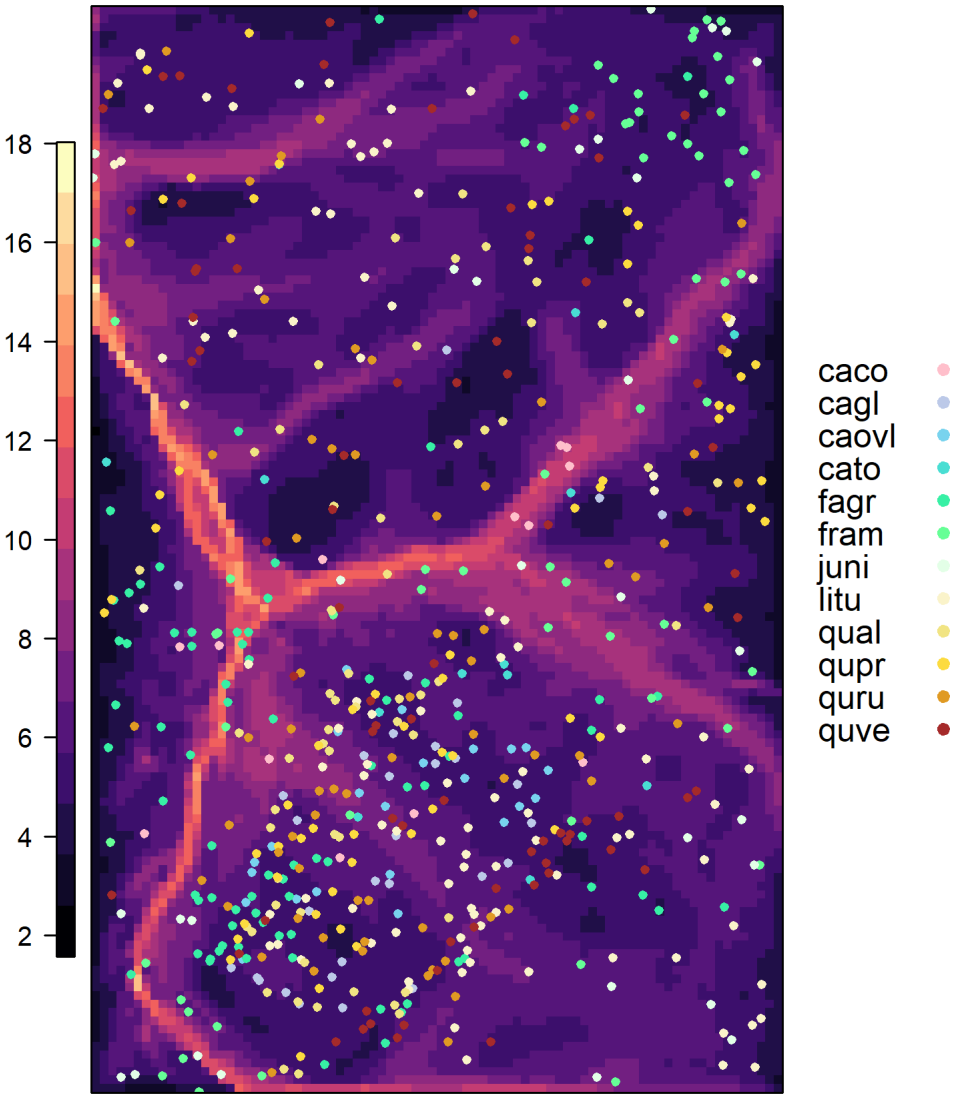

Figure S2: Location of cored trees

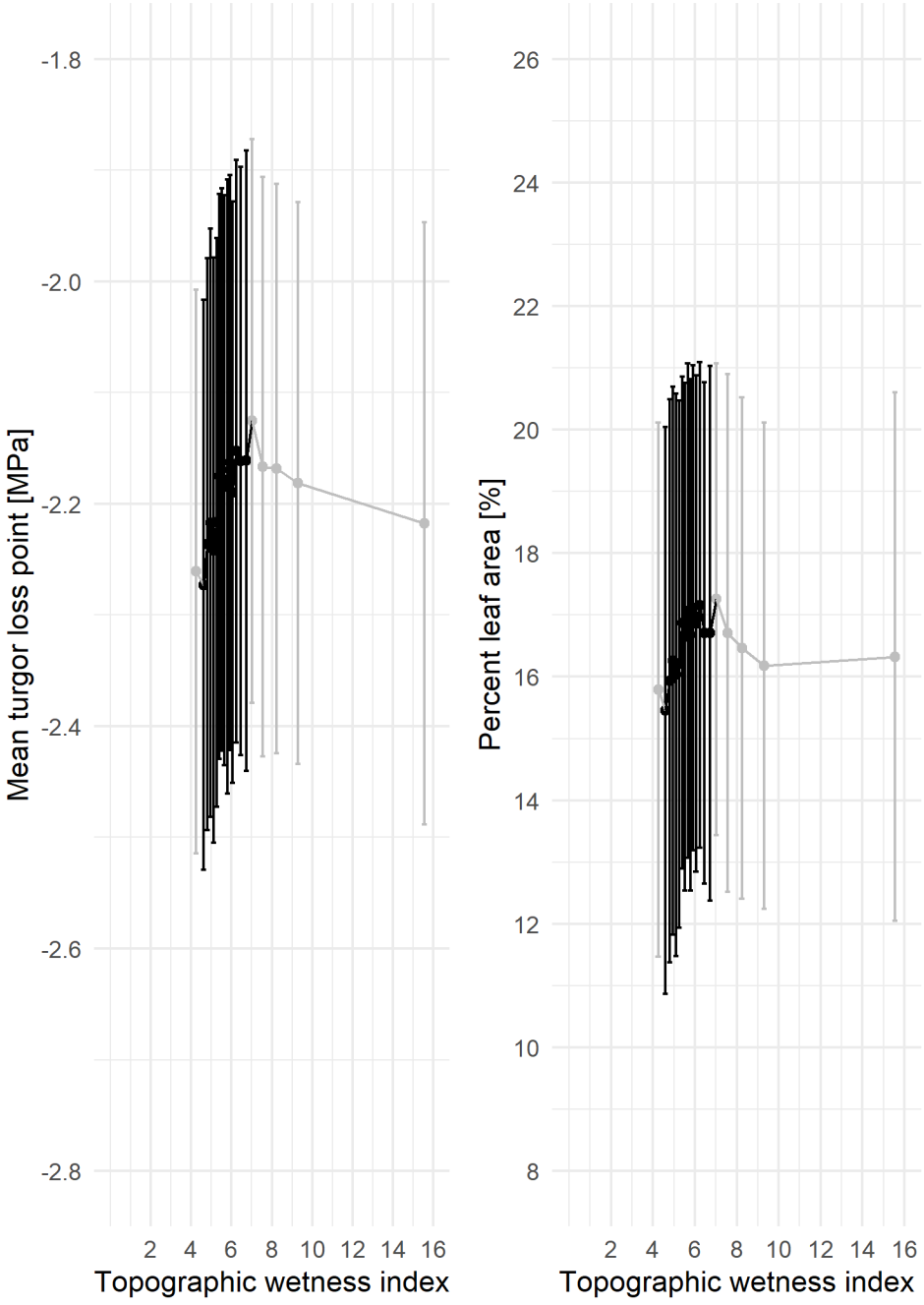

Figure S3: Traits with TWI